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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/053,150	11/02/2001	Christopher W. Gabrys	IG2211US	5857

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EXAMINER
ELKASSABGI, HEBA

ART UNIT	PAPER NUMBER
2834	

DATE MAILED: 01/02/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/053,150	GABRYS,CHRISTOPER W.
	Examiner	Art Unit
	Heba Elkassabgi	2834

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5,7-8,13,15-16* is/are rejected.

7)☒ Claim(s) *6,9-12 and 14* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Specification

The abstract of the disclosure is objected to because the length of the abstracts the maximum number of 150 words. Correction is required. See MPEP § 608.01(b).

Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

The disclosure is objected to because of the following informalities: A subtitle is needed for introduction of the Claims.

Appropriate correction is required.

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the coil having leads for connection to a source of electrical power, and the electrical power providing a control flux through the air gaps and around the permanent magnets through the shunts, in Claim #1, must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

Claims 7 and 8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Dependent claims 7 and 8 claim "rings", however

independent claim 1 claim "ring", the examiner will assume that the applicant is claiming one ring for the permanent magnet.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim1, 2, 3, 15, and 16are rejected under 35 U.S.C. 103(a) as being unpatentable over New (U.S. Patent 5406157). and further in view of Meeks et al. (U.S. Patent 5315197).

New illustrates in Figure 1 a an electromagnetic bearing a rotor (14) that is having an axially-facing surface supported for rotation about an axis of rotation; and a stator (12) that is axially separated from rotor surface by an air gap (AG) and magnetically supporting the rotor axially. A stator (12) having an annular electromagnetic coil (19) that is attached to two radially spaced-apart concentric ring poles that are spaced apart from the rotor surface and defining two annular axial air gaps (AG) on a single axial side of the rotor (14). The electromagnetic coil (19) lies between the ring poles of the stator (12) and having an axis that is oriented co-axially with the axis of rotation and the coil (19) the axial air gaps (AG) define a plane that is exactly perpendicular to the axis of rotation.

Meeks et al. Discloses in Figure 4 an electromagnetic bearing having a permanent magnet (32) in said stator (14) for producing a bias flux through first and second bias flux paths (30,34). The first path (30) including portions of both of ring poles, both of said axial air gaps (28) and the second path (34) include shunt (thrust disc)(18) that is magnetically parallel with the rotor (R) and bypasses the axial air gaps (28). The second path (34) has reluctance to the flux from the permanent magnet (32), that is comparable with magnetic reluctance of the first path (30). The second path (34) has a pluraity of paths. Further including an annular ferromagnetic region that is axially aligned with the stator poles (14) to cooperate magnetically with the stator (14) to produce an attractive force of the bearing multiple poles through which flux passes in each direction between the rotor and stator, in order to generate a relatively consistent high density magnetic flux that is conducted across the air gap.

It would have been obvious to one of ordinary skill in the art to combine the reference of New with Meeks et al. in order to generate a relatively consistent high-density magnetic flux that is conducted across the air gap.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over New (U.S. Patent 5406157) and further in view of Meeks et al. (U.S. Patent 5315197) and Murakami et al. (U.S. Patent 6213737).

New illustrates in Figure 1 a an electromagnetic bearing a rotor (14) that is having an axially-facing surface supported for rotation about an axis of rotation; and a

stator (12) that is axially separated from rotor surface by an air gap (AG) and magnetically supporting the rotor axially. A stator (12) having an annular electromagnetic coil (19) that is attached to two radially spaced-apart concentric ring poles that are spaced apart from the rotor surface and defining two annular axial air gaps (AG) on a single axial side of the rotor (14). The electromagnetic coil (19) lies between the ring poles of the stator (12) and having an axis that is oriented co-axially with the axis of rotation and the coil (19) the axial air gaps (AG) define a plane that is exactly perpendicular to the axis of rotation.

Meeks et al. Discloses in Figure 4 an electromagnetic bearing having a permanent magnet (32) in said stator (14) for producing a bias flux through first and second bias flux paths (30,34). The first path (30) including portions of both of ring poles, both of said axial air gaps (28) and the second path (34) include shunt (thrust disc)(18) that is magnetically parallel with the rotor (R) and bypasses the axial air gaps (28). The second path (34) has reluctance to the flux from the permanent magnet (32), that is comparable with magnetic reluctance of the first path (30). The second path (34) has a pluraity of paths. Further including an annular ferromagnetic region that is axially aligned with the stator poles (14) to cooperate magnetically with the stator (14) to produce an attractive force of the bearing multiple poles through which flux passes in each direction between the rotor and stator, in order to generate a relatively consistent high density magnetic flux that is conducted across the air gap.

Murakami et al. Illustrates in figure 16 that the stator inner ring pole (60) is of a solid cylinder, because the magnetic flux vibrates in different regions of the magnetic poles.

It would have been obvious to one of ordinary skill in the art to combine the reference of New with Meeks et al. in order to generate a relatively consistent high-density magnetic flux that is conducted across the air gap and the ring of Murakami et al. for the magnetic flux that vibrates in different regions of the magnetic poles.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over New (U.S. Patent 5406157) and further in view of Meeks et al. (U.S. Patent 5315197) and Ito et al. (U.S. Patent 5525849).

New illustrates in Figure 1 a an electromagnetic bearing a rotor (14) that is having an axially-facing surface supported for rotation about an axis of rotation; and a stator (12) that is axially separated from rotor surface by an air gap (AG) and magnetically supporting the rotor axially. A stator (12) having an annular electromagnetic coil (19) that is attached to two radially spaced-apart concentric ring poles that are spaced apart from the rotor surface and defining two annular axial air gaps (AG) on a single axial side of the rotor (14). The electromagnetic coil (19) lies between the ring poles of the stator (12) and having an axis that is oriented co-axially with the axis of rotation and the coil (19) the axial air gaps (AG) define a plane that is exactly perpendicular to the axis of rotation.

Meeks et al. Discloses in Figure 4 an electromagnetic bearing having a permanent magnet (32) in said stator (14) for producing a bias flux through first and second bias flux paths (30,34). The first path (30) including portions of both of ring poles, both of said axial air gaps (28) and the second path (34) include shunt (thrust disc)(18) that is magnetically parallel with the rotor (R) and bypasses the axial air gaps (28). The second path (34) has reluctance to the flux from the permanent magnet (32), that is comparable with magnetic reluctance of the first path (30). The second path (34) has a pluraity of paths. Further including an annular ferromagnetic region that is axially aligned with the stator poles (14) to cooperate magnetically with the stator (14) to produce an attractive force of the bearing multiple poles through which flux passes in each direction between the rotor and stator, in order to generate a relatively consistent high density magnetic flux that is conducted across the air gap.

Ito et al. disclose in Figure 3 a rotor (7) having the permanent magnet (8) being of a ring shape, so that the magnet id fixed to the rotor.

It would have been obvious to one of ordinary skill in the art to combine the reference of New with Meeks et al. in order to generate a relatively consistent high density magnetic flux that is conducted across the air gap and the ring of Ito et al. so that the magnet is securely fixed to the rotor.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over New (U.S. Patent 5406157) and further in view of Meeks et al. (U.S. Patent 5315197) and Bernus (U.S. Patent 5625240).

New illustrates in Figure 1 a an electromagnetic bearing a rotor (14) that is having an axially-facing surface supported for rotation about an axis of rotation; and a stator (12) that is axially separated from rotor surface by an air gap (AG) and magnetically supporting the rotor axially. A stator (12) having an annular electromagnetic coil (19) that is attached to two radially spaced-apart concentric ring poles that are spaced apart from the rotor surface and defining two annular axial air gaps (AG) on a single axial side of the rotor (14). The electromagnetic coil (19) lies between the ring poles of the stator (12) and having an axis that is oriented co-axially with the axis of rotation and the coil (19) the axial air gaps (AG) define a plane that is exactly perpendicular to the axis of rotation.

Meeks et al. Discloses in Figure 4 an electromagnetic bearing having a permanent magnet (32) in said stator (14) for producing a bias flux through first and second bias flux paths (30,34). The first path (30) including portions of both of ring poles, both of said axial air gaps (28) and the second path (34) include shunt (thrust disc)(18) that is magnetically parallel with the rotor (R) and bypasses the axial air gaps (28). The second path (34) has reluctance to the flux from the permanent magnet (32), that is comparable with magnetic reluctance of the first path (30). The second path (34) has a pluraity of paths. Further including an annular ferromagnetic region that is axially aligned with the stator poles (14) to cooperate magnetically with the stator (14) to

produce an attractive force of the bearing multiple poles through which flux passes in each direction between the rotor and stator, in order to generate a relatively consistent high density magnetic flux that is conducted across the air gap.

Bernus illustrates in Figure 2 the permanent magnet ring (20) that is axially polarized, so that the rotor is returned by a passive means that is displaced axially.

It would have been obvious to one of ordinary skill in the art to combine the reference of New with Meeks et al. in order to generate a relatively consistent high-density magnetic flux that is conducted across the air gap and the ring of Bernus so that the rotor is returned by a passive means that is displaced axially.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over New (U.S. Patent 5406157) and further in view of Meeks et al. (U.S. Patent 5315197) and Meeks et al (WO 95/05700).

New illustrates in Figure 1 a an electromagnetic bearing a rotor (14) that is having an axially-facing surface supported for rotation about an axis of rotation; and a stator (12) that is axially separated from rotor surface by an air gap (AG) and magnetically supporting the rotor axially. A stator (12) having an annular electromagnetic coil (19) that is attached to two radially spaced-apart concentric ring poles that are spaced apart from the rotor surface and defining two annular axial air gaps (AG) on a single axial side of the rotor (14). The electromagnetic coil (19) lies between the ring poles of the stator (12) and having an axis that is oriented co-axially

with the axis of rotation and the coil (19) the axial air gaps (AG) define a plane that is exactly perpendicular to the axis of rotation.

Meeks et al. (U.S. 5315197) discloses in Figure 4 an electromagnetic bearing having a permanent magnet (32) in said stator (14) for producing a bias flux through first and second bias flux paths (30,34). The first path (30) including portions of both of ring poles, both of said axial air gaps (28) and the second path (34) include shunt (thrust disc)(18) that is magnetically parallel with the rotor (R) and bypasses the axial air gaps (28). The second path (34) has reluctance to the flux from the permanent magnet (32), that is comparable with magnetic reluctance of the first path (30). The second path (34) has a pluraity of paths. Further including an annular ferromagnetic region that is axially aligned with the stator poles (14) to cooperate magnetically with the stator (14) to produce an attractive force of the bearing multiple poles through which flux passes in each direction between the rotor and stator, in order to generate a relatively consistent high density magnetic flux that is conducted across the air gap.

Meeks et al. (WO 95/05700) illustrates in Figure2 a permanent magnet ring (32) that is radially polarized, to generate a constant flux high-density magnetic field between the housing and the thrust disc.

It would have been obvious to one of ordinary skill in the art to combine the reference of New with Meeks et al. in order to generate a relatively consistent high density magnetic flux that is conducted across the air gap and the ring to generate a constant flux high density magnetic field between the housing and the thrust disc.

Allowable Subject Matter

Claims 6 and 9-14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Heba Elkassabgi whose telephone number is (703) 305-2723. The examiner can normally be reached on M-Th (6:30-3:30), and every other Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nestor Ramirez can be reached on (703) 308-1371. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-3431 for regular communications and (703) 305-3432 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1782.

NESTOR RAMIREZ
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800

HYE
December 26, 2002